BBC COMPUTER LITERACY PROJECT

PROVISIONAL CONTENT OF THE TELEVISION SERIES

Note This is not a definitive breakdown, the emphasis and balance may change

Programme 1 - What is a Computer?

In this introductory programme we need to try and find out exactly what it is which makes computers different from other forms of automatic machinery. We will do this by means of a quick resume of the history of computers from 18th Century automata through Babbage and ENIAC, ending with the BBC computer as an example of current microelectronic technology. In this programme we will be able to take the opportunity to show some of the nuts and bolts of using a micro - i.e. plugging it into a television set, using a cassette recorder, printer etc. in this way establishing the functional 'map' of a system. Running and examining a simple applications program will enable us to introduce the idea of the distinction between running a stored program and the use of the computer as a simple calculator.

Programme 2 - Control

Apart from their obvious 'computing' functions, microprocessors are shown controlling a wide variety of industrial and domestic processes. This gives us the opportunity to explain the fundamental principles of binary (perhaps a much-shortened version of the binary sequence in the pilot programme) and reference is made to the fact that of course all computer peripherals (i.e. VDU, keyboard, printer etc.,) are in effect being operated by this kind of control. We show an example of a practical and useful control application implemented on a micro and on the BBC machine make a start at writing some of the code which could be used in such a program. Input and output statements will be introduced, together with a few other keywords which are easy to understand.

cont...

Programme 3 - Computer Languages

In this programme we look at the drive to move away from conversing with computers using the binary patterns which they understand and towards a form of communication which means something to human beings. We see how FORTRAN was originally devised to allow computers to handle mathematical problems and how some of the details of today's BASIC derive from hardware features of that earliest of computer languages. We introduce the idea of programming structures and by writing a simple program demonstrate the way some of these have been incorporated into the BBC BASIC. We also look slightly to the future towards the possibility of programming in 'open' language and try to introduce the concept of language levels. For ultra high level languages we will investigate the claims of programs advertised as being able to write programs for those with no knowledge of programming. The idea that it is not computers which solve problems but people. Approaching a problem and using the computer to execute a solution after it has been thoroughly worked out on paper. The major programming ideas and the reflection of these in BASIC.

Programme 4 - Information Storage

We look at a number of examples in the real world of computers being used for simple data storage and retrieval functions - the electronic filing system - and using these examples explain some of the ways in which information may be encoded and stored in a computer's memory. We describe some of the ways in which both data and programs can be stored from reel to reel and hard disks on large mainframe computers to the cassette tape of the BBC micro, and cast a glance at future methods including magnetic bubble and CMOS RAM. We then show how some of the functions of data storage are fulfilled by the high level language idea of variables, the use of which we explain, and write a brief program on the BBC micro to demonstrate this. Variables and data manipulation in BASIC. The idea of ARRAYS.

Programme 5 - Computer Communications

The ability to store, manipulate and retrieve information, to control peripheral devices and to cope with ever more complex calculations has been enormously enhanced by linking processors and whole computers together. In this programme we should look at both of these developments and see (1) how the idea of distributed processing can enormously expand the power of the single computer, and (2) how linking large data base systems together can make enormous quantities of information immediately accessible. At the micro level we could look at the networking facilities on the BBC microcomputer, perhaps with reference to its use in the classroom. Viewdata and Telesoftware. Consolidation of the fundamentals of the 'common sub-set' of BASIC instructions.

Programme 6 - Non Textual Output

The use of keyboard and VDU is of course only a specialised use of the computer's control abilities. In this programme we see how text generation is not the only way of getting output from a computer and in particular we look at sound and graphical output. We show examples of the latest voice generating equipment in use, at the use of music boards in commercial electronic organs and the changes that large computers are bringing to television and film graphics. At the micro level we explore some of the BBC computer's advanced graphics facilities and also the voice generator - should it appear - and perhaps demonstrate the music package which combines both graphics and sound. Drawing lines and patterns in BASIC and making sounds.

Programme 7 - Modelling and Simulation

In this programme we should look at the very practical use being made of computers both large and small to behave according to rules given to them by their programmers. We see how this facility can be applied at the highest level to training pilots and policemen and at the micro level how a modelling package like Visicalc can help enterprises of all kinds to work out plans that would otherwise have taken weeks to calculate rather than minutes. We show how computer games - even Space Invaders - work on precisely the same principle and how computers may be used to physically simulate electronic components.
Some BASIC statements connected with games writing procedures: iteration; PLOT, POINT, random numbers; subroutines, etc.

Programme 8 - Computers Which Learn

In this programme we look at the more advanced applications of computers and see how they can be made to simulate a kind of rudimentary thinking. We see how the problems dealt with can be divided into one sort which can be completely computed by processes which are mechanical in nature, and another kind in which even the fastest computers would take forever to completely calculate. We examine the concept of a decision tree and see how the application of heuristics - i.e. rules of thumb - can be used to parallel the way in which humans apply intelligence. We look at applications of this area of computer science and see how the principles must be applied to advanced projects such as 'expert systems' and apparently simple programs like games. We look at the progress made in getting computers to learn even at the simple BBC micro level.

Programme 9 - Pattern Recognition

This programme is concerned with one of the most common applications of human intelligence which is proving very difficult to apply to computers. We look at some of the simple mechanical applications of pattern recognition and show how they lie at the root of most of the computer's ordinary activities.

We find out how far the recognition of pattern can be taken, using only the simpler mechanical computer concepts. We then show the limits on this, when trying to get computers to understand voices, read letters and so on. We show that beyond a certain point, success depends on applying artificial intelligence techniques, and what the main difficulties are. We look at the progress made in optical character recognition and in the attempts to make computers 'creative' in music and language. At the micro level, we see some of the devices available for voice input and consider the future of the voice-input typewriter.

Programme 10 - Robots and the Future

In this programme we look at one of the functions of computer science, the self-propelled, manipulative thinking machine, and see what progress has been made in this direction. We look at the way individual robot arms are being developed and how they can be controlled by the simplest microcomputer. We look at robot propulsion and see some of the micromouse contestants. We see that any advances in this area depend upon the application of all the elements of computer science: modelling, pattern judgement, artificial intelligence, and so on. We question how far these developments will take us in the foreseeable future and look at more practical and immediate applications of the microcomputer. We speculate on what contribution they may make to business, education and the home.

16 June 1981